

Appl. No. 10/822,344
Reply dated: April 17, 2006
Reply to Office Action of November 15, 2005

AMENDMENTS TO THE CLAIMS

Please amend claims 1, 2, 4 and 5 and add claims 7-9 as follows. This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently Amended) An apparatus for controlling a pose of a three-dimensional object including one or more interconnected three-dimensional structures elements, comprising:

means for specifying a first control object having a first pose in three dimensions, and a second control object having a second pose in three dimensions, wherein a pose is defined by at least a direction and a roll around the direction;

means for receiving data defining a path in the three-dimensional object and associated with the first and second poses;

means for generating position and direction information for each of the one or more interconnected elements three-dimensional structures in three dimensions along the defined path in the three-dimensional object, such that each three-dimensional structure is associated with a different intermediate position along the path and a direction at its intermediate position; and

means for determining an amount of roll around the direction for each of the one or more interconnected three-dimensional structures elements using quaternion interpolation between the roll of the first pose and the roll of the second pose.

2. (Currently Amended) The apparatus of claim 1, wherein the one or more interconnected elements three-dimensional structures defines a spine of the three-dimensional object.

3. (Original) The apparatus of claim 1, wherein the quaternion interpolation permits a determination of a rotation greater than 180 degrees.

4. (Currently Amended) A method for controlling a pose of a three-dimensional object including one or more interconnected three-dimensional structures elements, comprising:

receiving data describing a first ~~post~~ pose of a first control object in three dimensions, and a second pose of a second control object in three dimensions, wherein a pose is defined by at least a direction and a roll around the direction;

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specifying a path in the three-dimensional object associated with the first and second poses;

determining position and direction information for each of the one or more interconnected three-dimensional structures elements in three dimensions along the defined path in the three-dimensional object, such that each three-dimensional structure is associated with a different intermediate position along the path and a direction at its intermediate position; and

determining an amount of roll around the direction for each of the one or more interconnected three-dimensional structures elements using quaternion interpolation between the roll of the first pose and the roll of the second pose.

5. (Currently Amended) The method of claim 4, wherein the one or more interconnected three-dimensional structures elements defines a spine of the three-dimensional object.

6. (Original) The method of claim 4, wherein the quaternion interpolation permits a determination of a rotation greater than 180 degrees.

7. (New) A computer program product comprising:

a computer readable medium;

computer program instructions stored on the computer readable medium that, when processed by a computer, instruct the computer to perform a method for controlling a pose of a three-dimensional object including one or more interconnected three-dimensional structures, comprising:

receiving data describing a first pose of a first control object in three dimensions, and a second pose of a second control object in three dimensions, wherein a pose is defined by at least a direction and a roll around the direction;

specifying a path in the three-dimensional object associated with the first and second poses;

determining position and direction information for each of the one or more interconnected three-dimensional structures in three dimensions along the defined path in the three-dimensional object, such that each three-dimensional structure is associated with a different intermediate position along the path and a direction at its intermediate position; and

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determining an amount of roll around the direction for each of the one or more interconnected three-dimensional structures using quaternion interpolation between the roll of the first pose and the roll of the second pose.

8. (New) The computer program product of claim 7, wherein the one or more interconnected three-dimensional structures defines a spine of the three-dimensional object.

9. (New) The computer program product of claim 7, wherein the quaternion interpolation permits a determination of a rotation greater than 180 degrees.